

## IN THE CLAIMS

1           1. [currently amended] A magnetic pickup for a stringed musical instrument,  
2       comprising:

3                   magnet means for supplying a magnetic field which envelopes strings of a  
4       musical instrument;

5                   an upper coil means for sensing fluctuations in a magnetic field caused  
6       primarily by said magnet means and generating an electrical string signal  
7       therefrom;

8                   a lower coil means for sensing fluctuations in a primarily ambient magnetic  
9       field caused by unwanted noise and for generating an electrical noise signal  
10      therefrom, said lower coil means having significantly smaller size and fewer  
11      windings than said upper coil means;

12                  connection means for coupling said lower coil means and said upper coil  
13      means together so said string signal and said noise signal are summed but are  
14      180 degrees out of phase;

15                  flux transfer means for diverting said magnetic flux lines in an ambient  
16      magnetic field not caused by said magnet means away from said said upper coil  
17      means and into a core of said lower coil means so as to cause electrical signals  
18      representing noise to be mostly in said electrical noise signal generated by said  
19      lower coil means, and for helping concentrate magnetic flux lines from said  
20      magnetic field caused by said magnet means so as to cause most of a  
21      conversion of magnetic field flux line fluctuation caused by vibration of said  
22      strings to electrical signal to occur in said upper coil means.

1           2. [currently amended] The apparatus of claim 1 ~~further~~ further comprising a trim

2 pot adjustable resistor means coupled to said lower coil means for allowing adjustment of  
3 the amount of cancellation of noise signal in said electrical string signal via summation  
4 with an adjustable amount of said electrical noise signal.

1 3. [currently amended] A magnetic pickup for a stringed musical instrument  
2 having a plurality of strings, comprising:

3 an upper coil form having an upper coil winding wrapped around said  
4 upper coil form to form an upper coil, said upper coil form preferably having a non  
5 ferrous upper plate and a non ferrous lower plate the same geometry as prior art  
6 single coil magnetic pickups;

7 one or more magnets in the center of said upper coil form and forming a  
8 support structure which separates said upper and lower plates so as to form a  
9 space around which said upper coil winding can be wound around said one or  
10 more magnets;

11 a lower coil form having a lower coil winding wrapped around said lower  
12 coil form so as to form a core, said lower coil being significantly smaller in cross-  
13 sectional area of said lower coil winding than the cross-sectional area of said  
14 upper coil winding;

15 flux transfer plate means for concentrating in the vicinity of said upper coil  
16 the magnetic flux generated by said one or more magnets in the center of said  
17 upper coil form, and fluctuating in accordance with vibrations of magnetically  
18 permeable strings of a stringed instrument, and for diverting ambient noise  
19 magnetic flux lines which are fluctuating in accordance with unwanted noise  
20 away from said upper coil and into said core of said lower coil;

21 connection means for coupling said upper coil to said lower coil such that

22 an output signal is generated which is the difference between an electrical signal  
23 generated in said upper coil and a signal generated in said lower coil.

1 4. [currently amended] The apparatus of claim 3 further comprising adjustable  
2 resistor means coupled to said lower coil, for adjusting the amount of noise signal  
3 generated by said lower coil that is applied to cancel unwanted noise in a signal  
4 generated in said upper coil, and wherein said lower coil is not shielded from ambient  
5 noise flux, and wherein said upper and lower plates of said upper coil form have  
6 electrostatic, non ferrous shielding material thereon.

1 5. [currently amended] The apparatus of claim 3 wherein said one or more  
2 magnets comprises a plurality of alnico rod magnets which do not extend from said upper  
3 coil form into said lower coil to reduce the amount of string signal flux which gets  
4 coupled into said lower coil, and wherein there is an air gap between said magnets in  
5 upper coil form and said core of said lower coil winding to reduce the amount of string  
6 signal flux which gets coupled into said lower coil, and wherein the cross-sectional area  
7 of said upper coil winding is approximately two times or more larger than the cross-  
8 sectional area of said lower coil winding.

1 6. [cancelled]

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1 7. [cancelled]

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1 8. [cancelled]

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1           9. [currently amended] A magnetic pickup for a stringed musical instrument having a  
2 plurality of strings, comprising:

3                 an upper coil form having an upper coil winding wrapped around said upper  
4 coil form to form an upper coil, said upper coil having a non ferrous upper plate and a  
5 non ferrous lower plate and support and separation structure:

6                 one or more magnets in the center of said upper coil form and forming said  
7 support and separation structure:

8                 a lower coil form having a lower coil winding wrapped around said lower coil  
9 form, said lower coil having a significantly smaller size and significantly fewer  
10 windings than said upper coil winding and having a core:

11                 flux transfer plate means for concentrating in the vicinity of said upper coil the  
12 magnetic flux generated by said one or more magnets in the center of said upper coil  
13 form, and fluctuating in accordance with vibrations of magnetically permeable strings  
14 of a stringed instrument, and for diverting ambient magnetic flux lines which are  
15 fluctuating in accordance with unwanted noise away from said upper coil and into  
16 said core of said lower coil:

17                 connection means for coupling said upper coil to said lower coil such that an  
18 output signal is generated which is the difference between an electrical signal  
19 generated in said upper coil and a signal generated in said lower coil:

20                 and wherein said one or more magnets is a ceramic bar magnet;

21 ~~The apparatus of claim 8~~ and further comprising a plurality of ferrous caps placed  
22 between a top of said bar magnet and said strings.

1           10. [currently amended] The apparatus of claim 3 wherein said flux transfer plate  
2 means is comprised of first and second ferrous plates formed so as to have vertical

3 walls which shield the sides of said upper coil winding, and horizontal walls magnetically  
4 coupled to said vertical walls ~~which shield said upper coil winding from said said lower~~  
5 ~~coil winding~~, and a second set of vertical walls magnetically coupled to said horizontal  
6 walls which guide magnetic flux into a core of said lower coil winding, and wherein  
7 vertical means orthogonal to a plane defined by said strings and horizontal means parallel  
8 to a plane defined by said strings.

1 11. [cancelled]

1 12. [Currently amended] A magnetic pickup for a stringed musical instrument having  
2 a plurality of strings, comprising:

3 an upper coil form having an upper coil winding wrapped around said upper  
4 coil form to form an upper coil, said upper coil form having an upper plate and a lower  
5 plate, each shielded with an electrostatic, non ferrous material;

6 one or more magnets in the center of said upper coil form which do not extend  
7 past said lower plate;

8 a lower coil form having a lower coil winding wrapped around said lower coil  
9 form and having a core, said lower coil winding having significantly smaller cross-  
10 sectional area and significantly fewer turns than said upper coil winding;

11 flux transfer plate means for concentrating in the vicinity of said upper coil the  
12 magnetic flux generated by said one or more magnets in the center of said upper coil  
13 form, and fluctuating in accordance with vibrations of magnetically permeable strings  
14 of a stringed instrument, and for diverting ambient magnetic flux lines which are  
15 fluctuating in accordance with unwanted noise away from said upper coil and into  
16 said core of said lower coil along a continuous path having no air gaps;

17 connection means for coupling said upper coil to said lower coil such that an  
18 output signal is generated which is the difference between an electrical signal  
19 generated in said upper coil and a signal generated in said lower coil;

20 and wherein said lower coil form and said flux transfer plate means are a  
21 single structure molded or fabricated using ferrous material;

22 The apparatus of claim 11 and wherein said ferrous material is ferrite.

1 13. [currently amended] A magnetic pickup for a stringed musical instrument having a  
2 plurality of strings, comprising:

3 an upper coil form having an upper coil winding wrapped around said upper  
4 coil form to form an upper coil;

5 one or more magnets in the center of said upper coil form;

6 a lower coil form having a lower coil winding wrapped around said lower coil  
7 form, said lower coil winding having a core and having significantly smaller cross-  
8 sectional area and significantly fewer windings than said upper coil winding;

9 flux transfer plate means for concentrating in the vicinity of said upper coil the  
10 magnetic flux generated by said one or more magnets in the center of said upper coil  
11 form, and fluctuating in accordance with vibrations of magnetically permeable strings  
12 of a stringed instrument, and for diverting ambient magnetic flux lines which are  
13 fluctuating in accordance with unwanted noise away from said upper coil and into  
14 said core of said lower coil;

15 connection means for coupling said upper coil to said lower coil such that an  
16 output signal is generated which is the difference between an electrical signal  
17 generated in said upper coil and a signal generated in said lower coil;

18 and wherein said lower coil form and said flux transfer plate means are a

19 single structure molded or fabricated using ferrous material;  
20 ~~The apparatus of claim 14 and~~ wherein said ferrous material is ~~powered~~  
21 powdered metal.

1 14. [cancelled]

1 15. [cancelled]

1 16. [currently amended] A magnetic pickup for a stringed musical instrument,  
2 comprising:

3 an upper coil form comprised of first and second plates formed of non ferrous  
4 material, each having a plurality of holes therein in which rod magnets may be  
5 inserted, said holes aligned so as to hold said rod magnets in parallel relationship  
6 when said upper coil form is assembled;

7 an upper coil of electrical conductor wrapped around said upper coil form;

8 a plurality of rod magnets inserted in the holes in said first and second plates  
9 of said upper coil form so as to be surrounded by windings of said upper coil;

10 a lower coil form made of any ferrous or non ferrous, rigid material that can  
11 serve as a bobbin around which a coil of wire can be wrapped and having a core  
12 slot therein, said lower coil form being substantially smaller in size than said upper coil  
13 form;

14 a lower coil winding of electrical conductor wrapped around said lower coil  
15 form, said lower coil winding being substantially smaller in cross-sectional area and  
16 number of turns than said upper coil;

17 a ferrous material slug inserted in said slot;

18                   flux transfer plates for concentrating in the vicinity of said upper coil the  
19                   magnetic flux generated by said one or more magnets in the vicinity of said upper coil  
20                   and for diverting ambient magnetic flux lines which are fluctuating in accordance with  
21                   unwanted noise away from said upper coil and into said core of said lower coil;  
22                   a printed circuit board for coupling said upper coil to said lower coil such that  
23                   an output signal is generated which is the difference between an electrical signal  
24                   generated in said upper coil and a signal generated in said lower coil.

1           17. [currently amended] A two-coil pickup for a stringed instrument having an upper  
2           coil arranged so as to be closest to strings of said stringed instrument and having a  
3           lower coil below said upper coil which is significantly smaller in size than said upper coil  
4           and having fewer windings than said upper coil and coupled to said upper coil so that  
5           signals generated in said upper and lower coils are summed but such that any signal  
6           generated in said lower coil is 180 degrees out of phase with any signal generated in  
7           said upper coil, and characterized by said upper coil having significantly larger size and  
8           significantly more windings than said lower coil ~~the same or very similar geometry to prior~~  
9           ~~art single coil pickups~~ and a ferrous flux transfer plate which shields said upper coil from  
10          magnetic flux variations caused by undesired noise and diverts magnetic field flux  
11          variations caused by undesired noise away from said upper coil into a core of said the  
12          lower coil so as to maximize the amount of noise signal generated in the lower coil and  
13          minimize the amount of noise signal picked up by the upper coil.

1           18. [currently amended] A process carried out in a two-coil pickup for a stringed  
2           instrument having an upper coil located near strings of said instrument and a lower coil  
3           situated further away from said strings than said upper coil, said upper coil having